样 品 承 认 书Sample Acknowledgment Letter

供应商名称（全称）Supplier Name (Full Name)	河源市迅维通讯技术有限公司 Heyuan Xunwei Communication Technology Co., Ltd	供应商代码 supplier code	2634	物料名称 Name	天线D壳组件Antenna D shell component
沃特沃德信息料号(P/N)Waterward Information Part Number (P/N)	3.S-5A02-000844-000	供应商料号(P/N)Supplier Part Number (P/N)	/	物料类型 Material type	结构料
项 目project	GF030	承认书版本号 Acknowledgment version number	V1.0	物料颜色 Acknowledgment version number	粉色 pink
送样数量Sample quantity	8	送样日期Sample delivery date	2024/8/23 August 23, 2024	是否环保要求物料 Is there anenvironmental requirement for	环保要求物料
物料描述 Material Description	Antenna D shell component, GF030, pink, PC+ABS, material texture, ROHS+Beach+halogen-free, VDI24/D shell speaker waterproof and dustproof net/D shell FPC connector compression foam, pasted with waterproof foam, SKU2,WCDMA: B1,2,4,5,8 / GSM : Quad band / LTE:1,2,3,4,5,7,8,20,28,38,39,40,41 (120MHz)+BT+FM+diversity antenna				

送样原因Reason for sample submission:

☐ 新物料New materials ☐新供应商new supplier ☐替代料2nd Source（Alternative 2nd Source） ☐工程变更（PCN/ECN）Engineering Change (PCN/ECN) ☐其他other_____ ___

附送报告列表:

Attached report list:

- ■ 产品规格书（Spec） *
- ■ Product Specification (Spec)*
- ☐ 原理图（电子料）
- ☐ Schematic diagram(electronic material)
- ■ 标准2D图纸 *
- ■ Standard 2D drawings*
- ☐ 安规认证报告
- ☐ Safety certification report
- ■ 关键元器件清单（BOM)*
- ■ Key Component List (BOM)*
- ☐ 实物解剖图
- ☐ Physical Anatomy Map ☐ 工艺菲林图
- ☐ Process Film Chart
- ■ 测试报告(☐ 沃特沃德信息 ☐ 供应商 ☐ 第三方 ☐ 客户）*
- ■ Test report (☐ Waterward Information ☐ Supplier ☐ Third Party ☐ Customer)*
- ■ 产品绿色环保数据(☐ 环保声明书 ☐ 环保报告）*
- ■ Product Green Environmental Protection Data (☐ Environmental Declaration ☐ Environmental Report)*
- ■ PMP或QC Chart管控流程图 *
- ■ PMP or QC Chart Control Flow Chart*
- ■ 全尺寸测量报告（CPK）*
- ■ Full size measurement report (CPK)*
- ■ 包装方式说明 *
- ■ Packaging instructions*
- ☐ 供应商产品命名规则
- ☐ Naming convention of supplier products
- ☐ 品质管控计划
- ☐ Quality control plan

说明：物料承认书必须包含带“*”文件，其他列表文件根据物料特性及要求进行提供。且必须与实物信息一致。其中电子物料测试报告必须包含可靠性测试报告及性能测试报告。包材、辅料可只提供全尺寸报告。有环保要求的物料必须提供环保数据（环保声明书或环保测试报告）。

Explanation: The material recognition form must include files with "*", and other list files are provided based on the material characteristics and requirements. And it must be consistent with the physical information. The electronic material testing report must include reliability testing report and performance testing report. Packaging materials and accessories can only provide full size reports. Materials with environmental requirements must provide environmental data (environmental declaration or environmental testing report).

评估结果Evaluation results:

☐完全认可（符合沃特沃德信息及客户要求）☐ Fully recognized (in accordance with Waterward information and customer requirements)

☐条件性认可(☐客户需求 ☐初步认可，规格认证 ☐其他_____ ___) 限量数量：_____

☐ Conditional Approval (☐ Customer Requirements ☐ Preliminary Approval, Specification Certification ☐ Other _____) Limited Quantity: _____

☐其他: ☐ Other:

备注：天线模具样品 Note: Sample of antenna mold

供应商物料制作确认：（须盖章，纸质文档加盖骑缝章）

Supplier material production confirmation: (must be stamped, paper documents must be stamped with a cross stitch seal)

组 织 Organization	制 作 Production	商务确认 Business confirmation	研发审核 R&D review	品质确认 Quality confirmation	批 准 Approval
签 字 Signature	王新峰	宋象桂	韩良光	朱崇贤	李文波
日 期Date	2024.8.23	2024.8.23	2024.8.23	2024.8.23	2024.8.23

沃特沃德信息核准：（涉及客制化标贴类需商务签核，手写签字附带签字日期）

Approval of Waterward Information: (For customized labeling, commercial signature is required, with handwritten signature and signature date attached)

组 织 Organization	制 作 Production	商务确认 Business confirmation	研发审核 R&D review	品质确认 Quality confirmation	批 准 Approval
签 字 Signature					
日 期Date					

一、变更记录栏 Change Record Column

序号 Serial	版本号 VERSION	变更内容Changes	修订人 Revised by	变更日期 Change date
1	V1.0	首次发行first issue	wang	2024.8.23
2				
3				
4				

二、样品图片 2.Sample image

正面图片Front image	背面图片Back image	丝印/条形码图片 Screen printing/barcode images

三、物料基本情况3、 Basic information of materials

1	类 别 Category	☐ 拉杆 材料类型及规格_____ ☐ Type and specification of pull rod material_____			☐ 金属冲压 材料类型及规格_____ ☐ Metal stamping material type and specifications			
2	FPC	材料类型及规格 Material type and	3M胶3M adhesive	镀金手指 化镀厚度 Gold fingering		背胶型号 Back glue model	9471	背胶供应商 Adhesive supplier	Xiang Hong

备注：上述不适用请使用“/”填充表示

四、BOM（关键物料清单）4.BOM (Key Bill of materials)

序号 Serial Number	物料名称Name	规格/性能参数 Specifications/Performance Parameters	单位 unit	用量 Dosage	供应商 supplier	备注notes
1	天线D壳组件Antenna D shell component	GSM4LTE 1/2/3/4/5/7/8/20/28/38/39/40/41 WCDMA 1/2/4/5/8	PCS	1	Xunwei/Eagle Sta	
2	以下空白					
3						
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FPC appearance standard FPC外观标准：:

1.表面平整、光滑，无污渍、损伤、撕裂、破裂、气泡、划痕、孔洞、分层和粘合材料；

1. The surface is flat, smooth, free from stains, damages, tears, fractures, bubbles, scratches, holes, delaminations, and adhesive materials;

2、FPC接头处不得有破损、缺失、变形、脱落、划伤等现象；

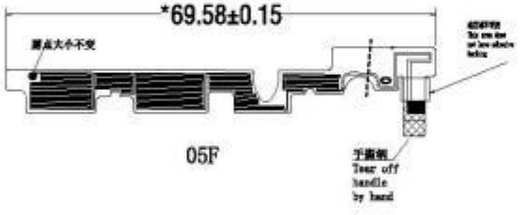
2. There should be no breakage, missing, deformation, detachment, or scratch at the joint of FPC;

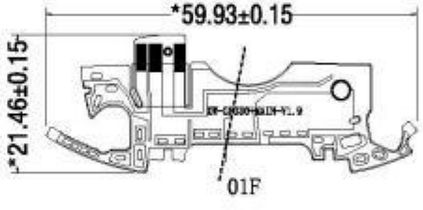
3.FPC的连接处没有开口边缘、裂缝或接缝痕迹；

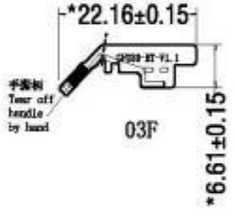
3. There are no open edges, fractures, or joint marks at the junction of FPC;

4.镀金厚度为0.5U

4. The gold plating thickness is 0.5U







河源市迅维通信技术有限公司 Heyuan Xunwei Communication Technology Co., Ltd									
第三视角 rigonometr				项目名称 Project	GF030	DATA Design	2024.8.23		
0~6	±0.05	⌖	0.03						
5~30	±0.08	○	0.03	产品名称	天线	审核 to examine	MD	li	
30~50	±0.10	◎	ø0.02	背胶	3M9471		RF	wang	
50~80	±0.12	⊥	0.02			批准ratify			
angle	±1°	▱	0.05	材料 Material	半对半	单位		比例	FIT version R.B
Page 1 of 1									

尺寸检测报告FAI Dimensional Inspection Report FAI

客戶 Custo	Water world		品名 Product Name	GF030		料号 Item number			单位 unit		mm
项 目 Testi e测r	规格 Testing items	要求 ask	公差public errand		量测 工具 Measurement	结果result				A/R	
			+	-		N0.1	NO.2	NO.3	NO.4		
ng 1	69.58		0.150	0.150	卡尺 calipers	69.61	69.60	69.61	69.60	A	
2	13.67		0.150	0.150	卡尺 calipers	13.68	13.69	13.68	13.69	A	
3	59.93		0.150	0.150	卡尺 calipers	59.96	59.94	59.96	59.95	A	
4	21.46		0.150	0.150	卡尺 calipers	21.47	21.48	21.47	21.48	A	
5	22.16		0.150	0.150	卡尺 calipers	22.17	22.19	22.17	22.18	A	
6	6.61		0.150	0.150	卡尺 calipers	6.62	6.63	6.62	6.64	A	
7	20.45		0.150	0.150	卡尺 calipers	20.47	20.46	20.47	20.48	A	
8	22.02		0.150	0.150	卡尺 calipers	22.04	22.05	22.04	22.05	A	
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备注 ：A是表示OK的，在公差范围以内（Accept）;R是表示NG的，超出公差范围的（Reject）

QC Engineering Drawing QC工程图

Description(零件名称)		FPC天线 FPC antena		Approved By(确认)		李文波liwenbo		Approved Date(确认日期)					
Process 工序		Test items 检验项目	Sampling scheme 抽样方案									Controlling of special characteristics 特殊特性管控	Processing plan for the bad products 不良处理方案
			Batch sampling 批量抽样			Process test 制程检验							
						First test 首检			Routing test 巡检			Whether contains special characteristics or not(*) 是否为特殊特性（*）	
			Measuring tool/method 测量工具/方法	Frequency 频率	Sample size 样本量	Measuring tool/method 测量工具/方法	Frequency 频率	Sample size 样本量	Measuring tool/method 测量工具/方法	Frequency 频率	Sample size 样本量		
1	进料Infeed	外观，材质，颜色，版本 Appearance, Material, Color, Version	来料检验标准，零件图纸 Incoming inspection standards, parts drawings	每批次 Per lot	5PCS	目测Visual inspection	每批次 Per lot	5PCS	目测Visual inspection	每批次 Per lot	5PCS	否NO	判退Retirement
2	进料检验Incoming inspection	产品尺寸 背胶粘性 Product size back adhesive adhesion	二次元 作业指导书 Secondary operation instruction	每批次 Per lot	5PCS	二次元 作业指导书 Secondary operation instruction	每批次 Per lot	5PCS	二次元 作业指导书 Secondary operation instruction	每批次 Per lot	5PCS	否NO	判退Retirement
3	盐雾测试Salt spray test	金手指是否氧化Is the golden finger oxidized	盐雾测试机Salt spray tester	每批次 Per lot	5PCS	盐雾测试机Salt spray tester	每批次 Per lot	5PCS	盐雾测试机Salt spray tester	每批次 Per lot	5PCS	否NO	判退Retirement
4	ROHS检测ROHS detection	有害物质检测报告Hazardous Substances Test Report	ROHS报告，IQC作业指导书 ROHS report, IQC operation instruction	每批次 Per lot	10PCS	ROHS报告，IQC作业指导书ROHS report, IQC operation instruction	每批次 Per lot	10PCS	ROHS报告，IQC作业指导书ROHS report, IQC operation instruction	每批次 Per lot	10PCS	否NO	判退Retirement
5	壳料/支架检查 Shell/bracket inspection	客户封样书 尺寸，外观 Size and appearance of customer sealed sample book	目测 卡尺Visual caliper	每批次 Per lot	10PCS	目测 卡尺 Visual caliper	每批次 Per lot	10PCS	目测 卡尺 Visual caliper	每批次 Per lot	10PCS	否NO	停线检查Stop line inspection
6	FPC贴合FPC bonding	是否有贴合到位 无贴偏，超出天线外形区Whether there is sticking in place without sticking deviation and beyond the	目测 内置天线检验标准 Inspection standard for visual built-in antenna	1/1H	10PCS	目测 内置天线检验标准 Inspection standard for visual built-in antenna	1/1H	10PCS	目测 内置天线检验标准 Inspection standard for visual built-in antenna	1/1H	10PCS	否NO	停线检查Stop line inspection
7	RF测试 RF Test	天线性能测试Antenna performance test	网络分析仪Network analyzer	1/1H	5PCS	网络分析仪Network analyzer	1/1H	5PCS	网络分析仪Network analyzer	1/1H	5PCS	否NO	停线检查Stop line inspection
8	FQC检验（成品） FQC inspection (finished product)	外观，金手指是否起翘，有无漏贴，贴出外形区 Appearance, whether the golden finger is warped, whether there is any missing sticking and	目测 作业指导书Visual Operation Instructions	每PCSPer PCS	全检Full inspection	目测 作业指导书 Visual Operation Instructions	每PCSPer PCS	全检Full inspection	目测 作业指导书 Visual Operation Instructions	每PCSPer PCS	全检Full inspection	否NO	全检 Full inspection
9	包装Packaging	数量、品名、规格 、标识 Quantity, commodity name, specification and identification	目测 作业指导书Visual Operation Instructions	每箱Per case	全检Full inspection	目测 作业指导书 Visual Operation Instructions	每箱Per case	全检Full inspection	目测 作业指导书 Visual Operation Instructions	每箱Per case	全检Full inspection	否NO	全检 Full inspection
10	出货检验Shipping Inspection	成品外观Finished product appearance	GB2828-2003II标准 GB2828-2003II Standard	每批次 Per case	10PCS	GB2828-2003II标准 GB2828-2003II Standard	每批次 Per case	10PCS	GB2828-2003II标准 GB2828-2003II Standard	每批次 Per case	10PCS	否NO	全检 Full inspection
11		重点尺寸Key dimensions	卡尺 二次元，内置天线检验标准Calipers, two dimensional, built-in antenna inspection standard	每批次 Per case	10PCS	卡尺 二次元，内置天线检验标准Calipers, two dimensional, built-in antenna inspection standard	每批次 Per case	10PCS	卡尺 二次元，内置天线检验标准Calipers, two dimensional, built-in antenna inspection standard	每批次 Per case	10PCS	否NO	全检 Full inspection

FPC 可靠性测试报告 FPC Reliability test report				
机 型Model			测试样品数 Number of test samples	10PCS
序号 Serial Number	测试项目 Test Items	使用仪器 Use of instruments	测试条件和要求 Test Conditions and Requirements	功能及外观测试结果 Functional and Appearance Test Results
1	高温储存 High temperature storage	恒温恒湿试验机Constant temperature and humidity testing machine	高温+70℃ 48小时，低温-30℃ 48 小时，60℃ 90%RH 48小时（置常温2H后测试）High temperature + 70 ℃ 48 hours, low temperature-30 ℃ 48 hours, 60 ℃ 90% RH 48 hours (tested after 2h at normal temperature)	合格 Qualified
2	低温储存 Low temperature storage	恒温恒湿试验机Constant temperature and humidity testing machine		
3	常温老化Room temperature aging	测试治具Test fixture	Aging at room temperature for 48H	合格Qualified
4	振 动 Vibration	震动机Vibrating machine	每个方向振动三十分钟(X,Y,Z)频率： 10 Hz～55Hz～10 Hz (1 min)振幅: 1.5mm Vibration in each di rection for 30 minutes (X, Y, Z) ~ Frequency: 10 Hz 55Hz 10 Hz (1 min) Amplitude: 1.5 mm	合格Qualified
5	剥离强度 Peel strength	剥离强度测试仪 Peel strength tester	以90度角拉伸剥离粘和剂：＞0.15N/mm; 覆盖膜：＞0.34N/mm; 导体：＞0.49N/mm; 保强：压敏胶＞0.15N/mm; 热固化胶＞0.34N/mm; The adhesive is stretch and peeled at an angle of 90 degrees: > 0.15 N/mm; Covering film: > 0.34 N/mm; Conductor: > 0.49 N/mm; Strength protection: pressure sensitive	通过Pass
6	盐雾试验 Salt spray test	盐雾试验测试机器 Salt spray test machine	放于盐雾箱内：温度为35℃ 10%浓度 放置48小时 Put it in a salt spray box: the temperature is 35 ℃ and the concentration is 10% for 48 hours	通过Pass
7	FPC拉力测试 FPC tensile test	拉力测试仪 Tensile force tester	FPC金手指长度×0.62kg=拉力值（大于此值）为OK，反之视为：NG FPC golden finger length × 0. 62 ϒ = tensile force value (greater than this value) is OK, otherwise it is regarded as: NG	通过Pass
8	FPC弯折测试 FPC bending test	手动Manual	FPC弯折区180度弯折200次 The FPC bend zone is bent 200 times at 180 degrees	合格Qualified
9	侵焊性测试 Penetration test	锡炉秒表镊子 Tin stove stopwatch tweezers	将测试品置于105±5℃的烘箱内1小时，在表面涂上一层助焊剂，垂直侵入235±5℃焊炉内持续5到6秒后取出 Place the test product in an oven at 105 ± 5 ℃ for 1 hour, coat the surface with a layer of flux, vertically intrude into the 235 ± 5 ℃ welding furnace for 5 to 6 seconds, and then take it out	合格Qualified
10	可焊性测试 Weldability test	恒温洛铁，锡丝 Constant temperature Luo iron and tin wire	将烙铁头温度保持在330±10℃来回手拖锡三次每次3到5秒 Keep the temperature of the welding head at 330 10 ℃ and drag the tin back and forth three times for 3 to 5 seconds each time	合格Qualified
11	附着力测试 Adhesion test	3M 胶带3M adhesive tape	用长大于50mm 3M 600胶带， 紧贴用手指压在产品的镀层或油墨的表面，停留10s，然后垂直迅速拉下胶带 3M 600 tape with length greater than 50mm, Press tightly on the surface of the coating or ink of the product with your fingers, stay for 10s, and then pull off the adhesive tape vertically and quickl	合格 Qualified
12	绝缘电阻测试 Insulation resistance test	兆欧表Megohmmeter	用100V的测试电压施压60s Pressure with 100V test voltage for 60s	通过Pass
13	耐电压测试 Withstand voltage test	耐电压测试仪Withstand voltage tester	用300V的测试电压施压60S Pressure 60S with a test voltage of 300V	通过Pass
14	孔内铜厚 Copper thickness in hole	打磨机、金像显微镜Grinding machine, gold image microscope	制作切片， 在显微镜下观察孔内铜的厚度及孔壁粗糙度 Make slices, The thickness of copper in the hole and the roughness of the hole wall were observed under a microscope	合格Qualified
15	镀通孔内厚度均匀性 Thickness uniformity in plating through holes	打磨机、金像显微镜Grinding machine, gold image microscope	制作切片， 在显微镜下观察孔内铜的厚度及孔壁粗糙度 Make slices, The thickness of copper in the hole and the roughness of the hole wall were observed under a microscope	合格Qualified
16	镀层厚度测试 Coating thickness test	X-荧光测试仪 X-fluorescence tester	依镀层类型选择测试档案 镀层---档案 按照要求选择对应的程式Select test file according to coating type Coating-file Select the corresponding program as required	合格Qualified
17	尺寸测试 Dimension test	二元平面坐标仪、针规、千分尺、高度尺Binary plane coordinate instrument, needle gauge, micrometer, height ruler	根据产品图纸,尺寸规格及申请要求进行测试Test according to product drawings, size specifications and application requirements	合格Qualified
18	外观 Appearance	目测Visual inspection	表面平整光滑清洁,无明显划痕，杂质、异色、变型.The surface is smooth and clean, without obvious scratches, impurities, different colors and variations.	合格Qualified

产品包装/运输/储存

产品包装Product Packaging：

1、将检验合格的FPC按照22set/片 中间用离型纸隔开 。
Separate the qualified FPC with release paper according to 22set/sheet.

2、将装好FPC叠放整齐，并用防水袋包紧，将数量标注在胶纸上。
Stack the FPC neatly, wrap it tightly in a waterproof bag, and mark the quantity on the gummed paper.

3、将现品票、e标、RoHS标、REACH标粘贴在顶层吸塑盒上。
Paste the current ticket, E-mark, RoHS mark and REACH mark on the top blister box.

4、将捆扎固定好的吸塑盒装入防水袋中，再装入卡通箱中，用透明胶带封住防水袋（多余空间使用气泡袋填充）

5、使用透明胶袋封箱，并在外箱侧面贴现品票、e标、ROHS标、REACH标。
Seal the box with transparent plastic bags, and discount the product ticket, E mark, ROHS mark and REACH mark on

图片参考Photo Reference：



单盘包装多盘叠放、捆扎包装粘贴标贴
Single-disc packing and multiple-disc stacking, bundling packaging and pasting labels


装箱封箱侧面标贴Packing and sealing side labeling

产品运输Product transportation：

FPC目前全部采用快递方法进行运输，如有特殊要求与我司沟通后单独处理。
At present, all FPC are transported by express delivery. If there are special requirements, they will be handled separately after communicating with our company.

储存条件Storage conditions：温度：18℃-25℃;湿度：40-70%。
18 ℃-25 ℃; Humidity: 40-70%.

GF030 手机天线样品承认书 Confirmation Letter for Mobile Antenna Sample

目录:

Directory:

GF030 手机天线样品承认书 Confirmation Letter for Mobile Antenna Sample

1、 项 目 基 本 信 息 说 明 Project Basic Information Description

1.1、手机外观图 Mobile phone appearance image

1.2、机型及壳料材质：Model and shell material:

GF030 为智能机 GF030 For smartphones

1.3、手机主板型号： Mobile motherboard model

本报告所使用主板型号 The motherboard model used in this report ff618-mb-v3.0-v322a.pcb

主天线

2、主天线 Main antenna

2.1、主天线工作频段： Main antenna operating frequency band:

GSM900/1800/850/1900

LTE 1/2/3/4/5/7/8/20/28/38/39/40/41

WCDMA 1/2/4/5/8

2.2、天线匹配电路 Antenna matching circuit

4.4、开关电路配置Switch circuit configuration

(GF030 NV0.2 2024.06.03)

RF端口 RF port	位号 Tag number	值 value	应用频段 Application frequency band
RF1	C0716	0欧	GSM900/G1900+W-B1/B2/B8 LTE-B1/B2/B7/B8/B38/B39/B41
RF2	R0715	4.7nH	GSM850+W-B5+LTE-B5/B20/B40
RF3	L0707	22nH	LTE-B28
RF4	L0711	8.2nH	GSM1800+LTE-B3/B4+W-B4

4.5、主集和分集通路配置

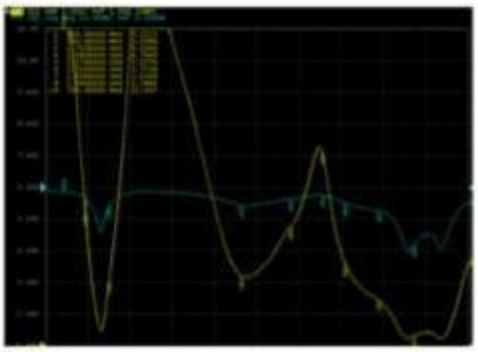
Main and branch channel configuration

主集 Main Collection	分集 diversity	应用频段 Application frequency band
下天线 Lower antenna	上天线 Up the antenna	GSM900/850/1800/1900+WCDMA-B1/B2/B4/B5/B8 LTE-B1/B2/B3/B5/B7/B8/B20/B28/B38/B39/B40/B41

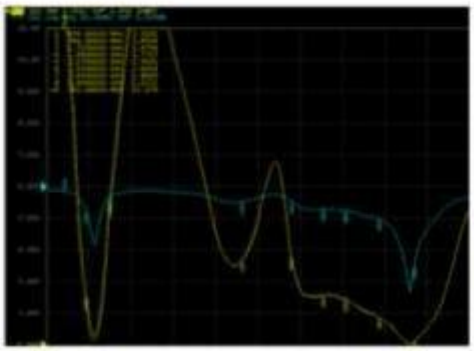
5、天线调试无源Antenna debugging passive

RF端口 RF port	应用频段 Application frequency band
RF1	GSM900/G1900+W-B1/B2/B8 LTE-B1/B2/B7/B8/B38/B39/B41
RF2	GSM850+W-B5+LTE-B5/B20/B40

RF1

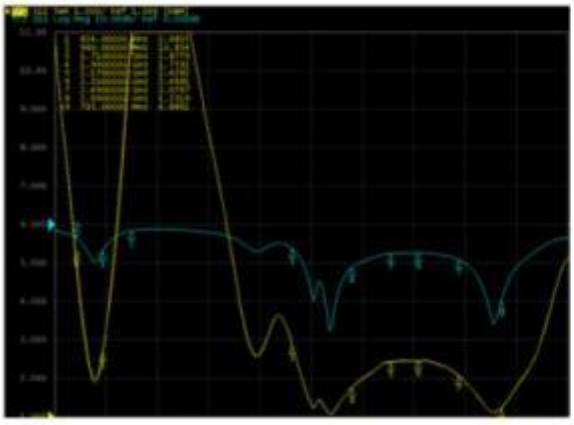


RF2

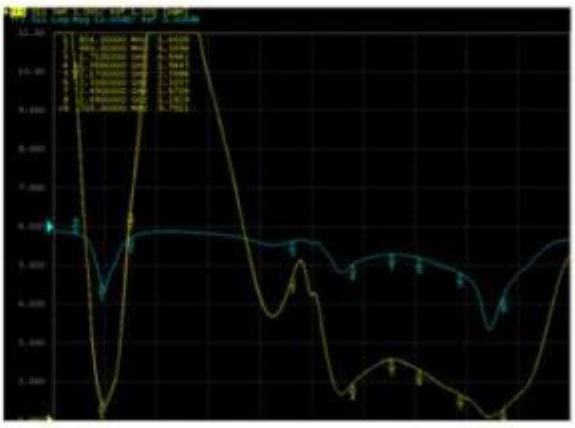


RF端口 RF port	应用频段 Application frequency band
RF3	LTE-B28
RF4	GSM1800+LTE-B3/B4+W-B4

RF3



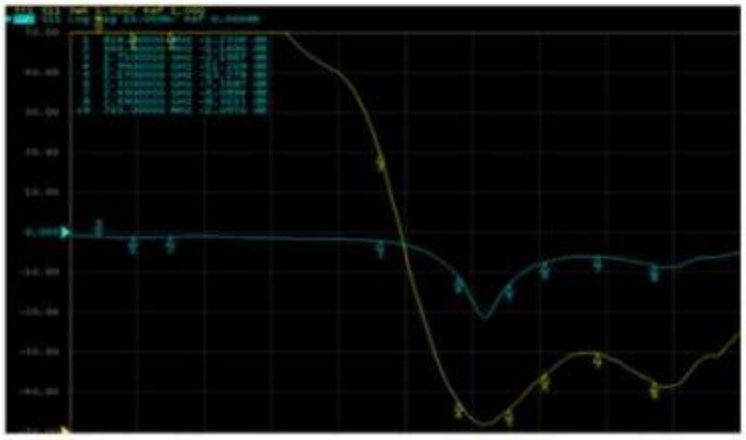
RF4



5、分集调试无源

Diversity debugging passive

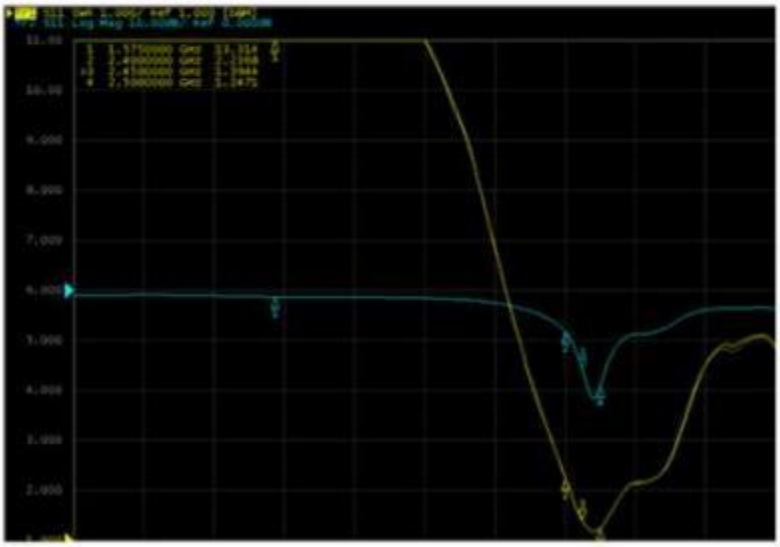
应用频段 Application frequency band
LTE-B1/B2/B3/B4/B7/B28/B38/B39/B40/B41 WCDMA-B1/B2/B4



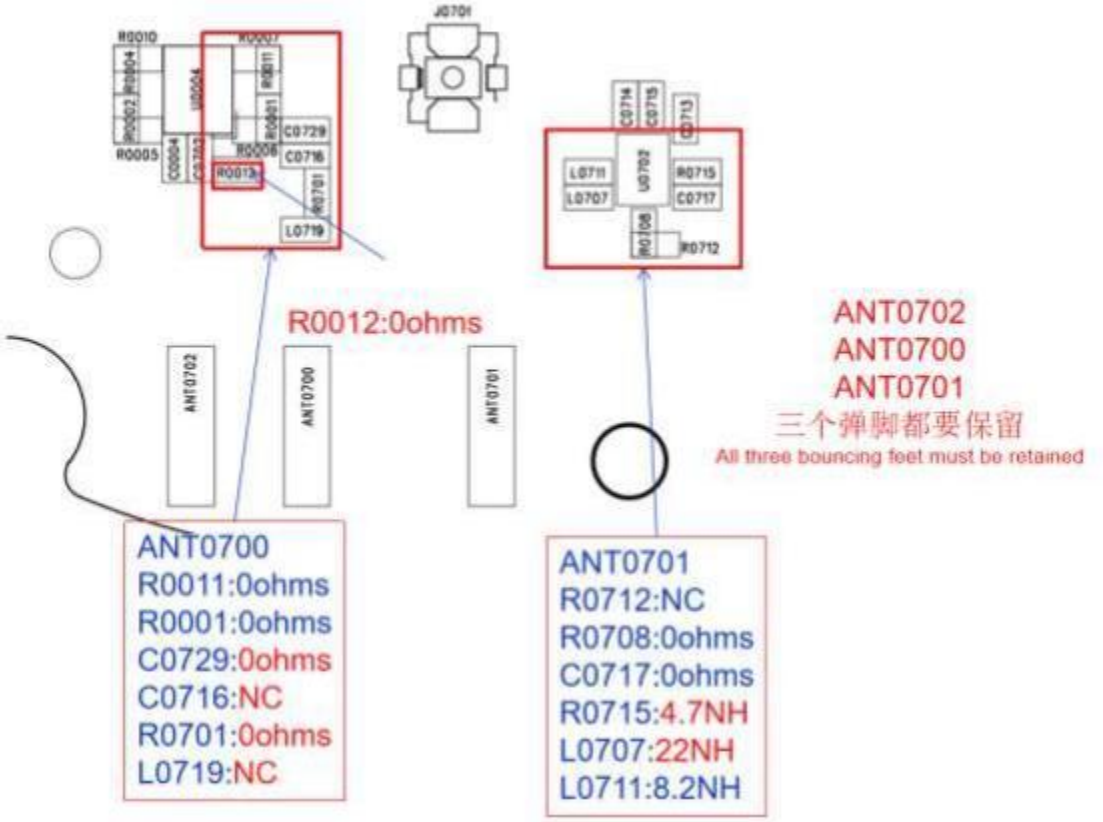
5、BT调试无源

BT debugging passive

应用频段 Application frequency band
BT

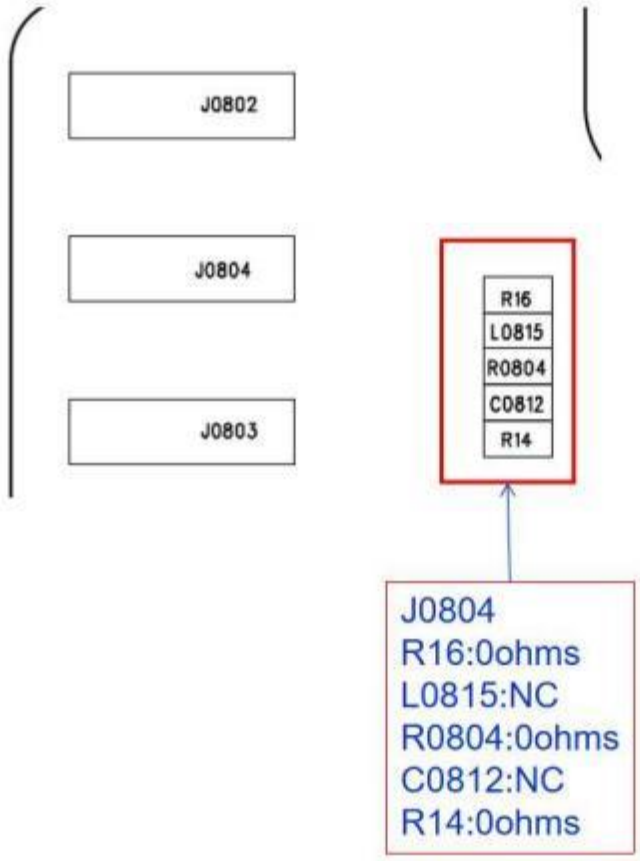


4.1 、天线匹配电路Antenna matching circuit

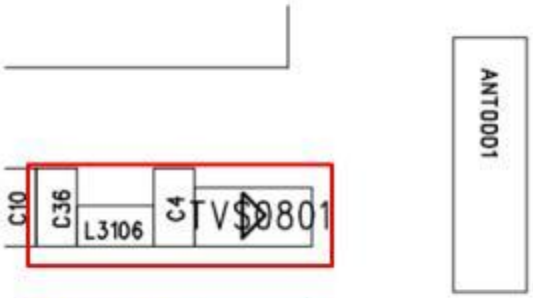


4.2 、蓝牙匹配电路 BT Antenna matching circuit

4.3、分集匹配电路Diversity matching circuit

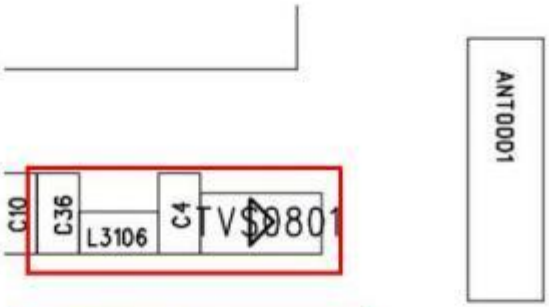


4.3、 FM匹配电路



ANT0001
C36:22PF
L3106:180NH
C4:NC
TVS0801:TVS管

4.4、 FM匹配电路FM matching circuit



ANT0001
C36:22PF
L3106:180NH
C4:NC
TVS0801:TVS Pipe

2.3、无源测试指标：Passive testing indicators:

频率范围(MHz) Frequency range(MHz)	699-960	1700-2170	2500-2700
VSWR	＜3.5	＜3.5	＜3.5

2.4、有源测试数据：Active Test Data

Band	Channel	Frequency (MHz)	TRP (dBm)			Calss A Limits (dBm)	
			FS	BHHR	BHHL	FS	BHHL/R
GSM 850	128	824.2	26.86	20.73	21.20	26	17
	190	836.6	27.55	21.16	20.80		
	251	848.8	28.04	21.63	20.40		
GSM 900	975	880.2	27.89	22.11	22.25	27	18
	38	897.6	28.43	22.15	23.05		
	124	914.8	26.79	20.41	21.51		
GSM 1800	512	1710.2	25.36	20.41	21.02	25	19
	699	1747.6	25.06	20.68	21.39		
	885	1784.8	25.17	20.83	21.53		
GSM 1900	512	1850.2	24.77	21.44	22.10	25	19
	661	1880	25.29	20.85	21.64		
	810	1909.8	25.33	20.51	21.32		
WCDMA B1	9612	1922.4	18.34	13.35	14.35	19	13.5
	9750	1950	18.29	13.96	14.10		
	9888	1977.6	18.19	13.46	14.00		
WCDMA B2	9262	1852.4	18.60	14.06	14.69	19	13.5
	9400	1880	18.57	14.32	14.06		
	9538	1907.6	18.45	14.25	14.36		
WCDMA B4	1312	1712.4	18.33	12.57	13.24	19	13.5
	1413	1732.6	18.73	13.30	13.40		
	1513	1752.6	18.53	13.86	12.46		
WCDMA B5	4132	826.4	18.03	12.05	11.42	17	10
	4182	836.4	18.34	12.15	11.71		
	4233	846.6	18.07	11.83	11.65		
WCDMA B8	2712	882.4	18.87	12.27	11.98	17	10
	2788	897.6	17.82	12.05	11.90		
	2863	912.6	17.06	10.96	10.87		

Band	Channel	Frequency (MHz)	TIS (dBm)			Calss A Limits (dBm)	
			FS	BHHR	BHHL	FS	BHHL/R
GSM 850	128	869.2	-102.21	-97.89	-97.30	-102	-93
	190	881.6	-102.50	-97.49	-97.42		
	251	893.8	-101.33	-96.33	-96.83		
GSM 900	975	925.2	-101.71	-96.30	-96.73	-102	-94
	38	942.6	-102.29	-97.26	-97.98		
	124	959.8	-102.55	-97.29	-98.04		
GSM 1800	512	1805.2	-106.27	-101.64	-102.12	-104	-97
	699	1842.6	-107.03	-102.33	-102.32		
	885	1879.8	-105.49	-101.97	-102.41		
GSM 1900	512	1930.2	-103.19	-100.32	-101.22	-104	-97
	661	1960	-103.98	-100.22	-100.40		
	810	1989.8	-103.37	-99.27	-101.63		
WCDMA B1	10562	2112.4	-105.97	-101.58	-102.39	-107	-100
	10700	2140	-106.05	-102.21	-99.42		
	10838	2167.6	-106.45	-100.43	-98.35		
WCDMA B2	9662	1932.4	-107.58	-105.65	-104.95	-106	-99
	9800	1960	-108.50	-105.08	-105.87		
	9938	1987.6	-105.37	-102.52	-103.45		
WCDMA B4	1537	2112.4	-108.30	-104.46	-105.06	-107	-100
	1638	2132.6	-108.81	-105.49	-105.28		
	1738	2152.6	-108.99	-105.89	-105.51		
WCDMA B5	4357	871.4	-106.16	-100.06	-97.64	-103	-96
	4407	881.4	-105.29	-99.67	-97.24		
	4458	891.6	-104.92	-99.40	-97.44		
WCDMA B8	2937	927.4	-105.44	-99.95	-99.92	-104	-96
	3013	942.6	-105.49	-100.42	-100.27		
	3088	957.6	-105.13	-99.79	-100.02		

Band	Channel	Frequency (MHz)	Channel Bandwidth (MHz)	UL RB Allocation	TRP (dBm)			Calss A Limits (dBm)	
					FS	BHHR	BHHL	FS	BHHL/R
LTE B1	18050	1925	10	12 RB with RBstart=0	17.90	13.77	13.65	18	13
	18300	1950		12 RB with RBstart=19	17.32	13.38	13.35		
	18550	1975		12 RB with RBstart=38	17.72	13.01	13.30		
LTE B2	18650	1855	10	12 RB with RBstart=0	18.03	13.60	13.95	19	13.5
	18900	1880		12 RB with RBstart=19	17.95	13.71	14.34		
	19150	1905		12 RB with RBstart=38	17.89	13.64	13.66		
LTE B3	19250	1715	10	12 RB with RBstart=0	18.72	13.87	13.85	19	13.5
	19575	1747.5		12 RB with RBstart=19	18.62	13.40	13.55		
	19900	1780		12 RB with RBstart=38	18.35	13.43	13.37		
LTE B4	20000	1715	10	12 RB with RBstart=0	18.74	13.86	13.83	19	13.5
	20175	1732.5		12 RB with RBstart=19	18.56	13.72	13.35		
	20350	1750		12 RB with RBstart=38	18.68	13.14	13.17		
LTE B5	20450	829	10	12 RB with RBstart=0	17.63	10.42	10.55	17	10
	20525	836.5		12 RB with RBstart=19	17.88	10.31	10.81		
	20600	844		12 RB with RBstart=38	17.50	10.86	10.56		
LTE B7	20800	2505	10	12 RB with RBstart=0	17.44	15.02	14.96	18	13
	21100	2535		12 RB with RBstart=19	17.58	14.80	15.04		
	21400	2567.5		12 RB with RBstart=38	17.86	15.30	15.49		
LTE FDD 8	21500	885	10	12 RB with RBstart=0	18.22	11.15	11.73	17	10
	21625	897.5		12 RB with RBstart=19	17.69	10.86	11.62		
	21750	910		12 RB with RBstart=38	17.08	10.48	10.45		
LTE B20	24200	837	10	12 RB with RBstart=0	18.85	11.30	11.79	17	10
	24300	847		12 RB with RBstart=19	18.53	10.95	11.65		
	24400	857		12 RB with RBstart=38	18.08	10.58	11.56		
LTE B28	27260	708	10	12 RB with RBstart=0	17.94	12.40	12.67	16	9
	27410	723		12 RB with RBstart=19	19.27	12.56	13.33		
	27610	743		12 RB with RBstart=38	18.78	11.54	12.48		
LTE TDD 38	37850	2580	10	12 RB with RBstart=0	17.96	14.55	14.53	18	13
	38000	2595		12 RB with RBstart=19	18.12	14.89	14.99		
	38150	2610		12 RB with RBstart=38	17.88	15.12	15.18		
LTE TDD 39	38350	1890	10	12 RB with RBstart=0	18.08	14.69	14.54	19	13.5
	38450	1900		12 RB with RBstart=19	18.21	14.69	14.82		
	38550	1910		12 RB with RBstart=38	18.02	14.89	14.88		
LTE TDD 40	38750	2310	10	12 RB with RBstart=0	17.57	14.34	15.98	18	13
	39150	2350		12 RB with RBstart=19	17.76	14.40	16.03		
	39550	2390		12 RB with RBstart=38	17.98	14.23	15.94		
LTE TDD 41	40140	2545	10	12 RB with RBstart=0	17.73	15.05	15.09	19	13.5
	40620	2593		12 RB with RBstart=19	18.16	15.00	16.05		
	41140	2645		12 RB with RBstart=38	17.44	15.64	16.47		

Band	Channel	Frequency (MHz)	Channel Bandwidth (MHz)	UL RB Allocation	TIS (dBm)			Calss A Limits (dBm)	
					FS	BHHR	BHHL	FS	BHHL/R
LTE B1	50	2115	10	50 RB with RBstart=0	-96.92	-90.39	-93.58	-93	-88
	300	2140		50 RB with RBstart=0	-97.52	-90.95	-92.72		
	550	2165		50 RB with RBstart=0	-96.55	-90.64	-91.92		
LTE B2	650	1935	10	50 RB with RBstart=0	-96.60	-92.29	-93.81	-94	-89
	900	1960		50 RB with RBstart=0	-97.72	-92.74	-92.68		
	1150	1985		50 RB with RBstart=0	-94.80	-90.34	-92.54		
LTE B3	1250	1810	10	50 RB with RBstart=0	-95.49	-91.18	-92.39	-94	-89
	1575	1842.5		50 RB with RBstart=0	-95.03	-91.49	-93.89		
	1900	1875		50 RB with RBstart=0	-97.39	-92.87	-93.39		
LTE B4	2000	2115	10	50 RB with RBstart=0	-98.75	-94.03	-92.84	-94	-89
	2175	2132.5		50 RB with RBstart=0	-99.00	-93.45	-93.02		
	2350	2150		50 RB with RBstart=0	-98.51	-93.16	-93.31		
LTE B5	2450	874	10	50 RB with RBstart=0	-92.23	-87.97	-86.14	-92	-85
	2525	881,5		50 RB with RBstart=0	-92.08	-87.49	-86.51		
	2600	889		50 RB with RBstart=0	-90.28	-87.16	-86.26		
LTE B7	2800	2625	10	50 RB with RBstart=0	-97.11	-92.68	-91.87	-94	-89.5
	3100	2655		50 RB with RBstart=0	-96.53	-92.92	-91.26		
	3400	2685		50 RB with RBstart=0	-95.13	-92.04	-91.57		
LTE FDD 8	3500	930	10	50 RB with RBstart=0	-92.44	-86.55	-87.23	-91.5	-85
	3625	942.5		50 RB with RBstart=0	-91.94	-87.35	-87.31		
	3750	955		50 RB with RBstart=0	-91.80	-87.00	-87.70		
LTE B20	6200	796	10	50 RB with RBstart=0	-91.07	-86.58	-84.33	-92	-85
	6300	806		50 RB with RBstart=0	-92.74	-88.48	-85.64		
	6400	816		50 RB with RBstart=0	-92.30	-88.04	-85.51		
LTE B28	9260	763	10	50 RB with RBstart=0	-93.74	-88.25	-87.55	-91.5	-84
	9410	778		50 RB with RBstart=0	-92.82	-89.15	-87.12		
	9610	798		50 RB with RBstart=0	-91.85	-87.66	-86.72		
LTE TDD 38	37850	1890	10	50 RB with RBstart=0	-95.67	-91.28	-92.46	-94	-89
	38000	1900		50 RB with RBstart=0	-95.25	-91.12	-92.29		
	38150	1910		50 RB with RBstart=0	-94.98	-91.09	-91.47		
LTE TDD 39	38350	1890	10	50 RB with RBstart=0	-94.10	-91.26	-91.66	-94	-88
	38450	1900		50 RB with RBstart=0	-94.88	-91.01	-92.38		
	38550	1910		50 RB with RBstart=0	-93.80	-91.10	-91.98		
LTE TDD 40	38750	2310	10	50 RB with RBstart=0	-94.91	-91.04	-91.04	-93	-88
	39150	2350		50 RB with RBstart=0	-94.78	-91.16	-91.46		
	39550	2390		50 RB with RBstart=0	-94.57	-91.64	-91.25		
LTE TDD 41	40140		10	50 RB with RBstart=0	-94.85	-91.77	-91.83	-94	-88
	40620			50 RB with RBstart=0	-95.48	-91.08	-92.10		
	41140			50 RB with RBstart=0	-94.44	-91.40	-91.24		

5.1、天线调试无源效率-主天线

Antenna Debugging Passive Efficiency - Main Antenna

Freq（MHz）	EFFI%%
820	29
830	30
840	32
850	35
860	35
870	34
880	33

Freq（MHz）	EFFI%%
880	39
890	40
900	42
910	44
920	43
930	42
940	40
950	39
960	38

Freq（MHz）	EFFI%%
1710	22
1730	23
1750	24
1770	25
1790	25
1810	26
1830	25
1850	25
1870	24
1890	23

Freq（MHz）	EFFI%%
2300	21
2320	23
2340	25
2360	27
2380	29
2400	31
2500	32
2520	35
2540	37
2560	39
2580	40
2600	39
2620	41
2640	42
2660	44
2680	43
2700	44

5.2、天线调试无源效率-分集天线

Antenna Debugging Passive Efficiency - Diversity Antenna

Freq（MHz）	EFFI%%
1920	31
1940	31
1960	32
1980	34
2000	34
2020	35
2040	36
2060	36
2080	37
2100	36
2120	37
2140	39
2160	40
2180	41

Freq（MHz）	EFFI%%
2300	33
2320	35
2340	36
2360	36
2380	34
2400	35
2500	36
2520	38
2540	37
2560	35
2580	36
2600	36
2620	38
2640	39
2660	38
2680	37
2700	35

5 .3、 BT天线调试无源效率

Passive efficiency of BT antenna debugging

Freq（MHz）	EFFI%%
2400	35
2410	37
2420	38
2430	40
2440	41
2450	41
2460	39
2470	40
2480	38
2490	34

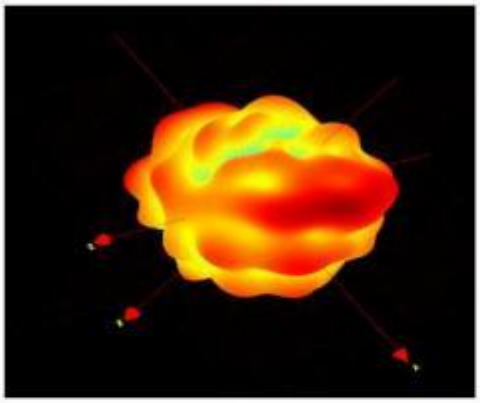
5 .4、 主天线增益 Main antenna gain

All of Implementation antenna
Main antenna(Antenna Label:A):
LTE: B1/B2/B3/B4/B5/B7/B8/20/B28/B38/B39/B40/B41 RX&TX ,
WCDMA: B1/B2/B4/B5/B8 RX&TX
GSM: B2/B3/B5/B8 RX&TX
DIV antenna(Antenna Label:B):
LTE: B1/B2/B3/B4/B7/B38/B39/B40/B41 RX
WCDMA:B1/B2/B4 RX
BT: 2.4G2412MHz~2472MHz&
Antenna Max. Peak Gain:
EGSM900:-1.7dBi
GSM850: -1.6dBi
DCS1800: -1.1dBi
DCS1900: -1.3dBi
WCDMA-B1:-1.2dBi
WCDMA-B2:-1.3dBi
WCDMA-B4:-1.1dBi
WCDMA-B5: -1.6dBi
WCDMA-B8: -1.7dBi
LTE-B1:-1.2dBi
LTE-B2:-1.3dBi
LTE-B3:-1.1dBi
LTE-B4:-1.1dBi
LTE-B5: -1.6dBi
LTE-B7: -0.2dBi
LTE-B8: -1.7dBi
LTE-B20: -1.6dBi
LTE-B28: -2.2dBi
LTE-B38:-0.3dBi
LTE-B40:-0.2dBi
LTE-B41:-0.2dBi
BT: -0.7dBi

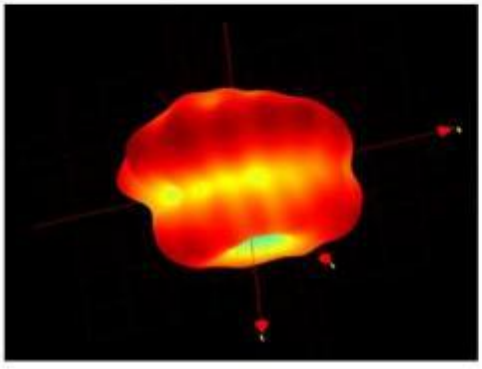
5 .5、 分集天线增益 Diversity antenna gain

All of Implementation antenna
Main antenna(Antenna Label:A):
LTE: B1/B2/B3/B4/B7/B38/B39/B40/B41 RX
WCDMA:B1/B2/B4 RX
Antenna Max. Peak Gain:
WCDMA-B1:-1.9dBi
WCDMA-B2:-1.8dBi
WCDMA-B4:-2.3dBi
LTE-B1:-1.9dBi
LTE-B2:-1.8dBi
LTE-B3:-2.3dBi
LTE-B4:-2.3dBi
LTE-B7: -1.4dBi
LTE-B38:-1.3dBi
LTE-B40:-1.0dBi
LTE-B41:-1.4dBi

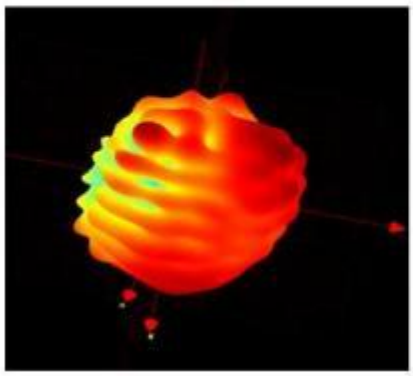
Main antenna gain apple chart(703~960M)



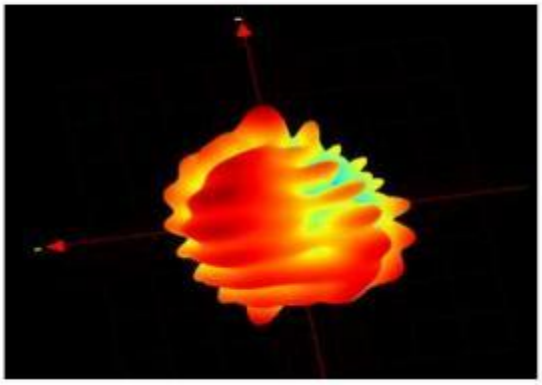
Main antenna gain apple chart(1710~2170M)



Main antenna gain apple chart(703~960M)



BT antenna gain apple chart(2400-2500M)



2.5、天线材质说明及安装方式 Antenna Material Description and Installation Method

GF030 主天线材质为主天线材质为 FPC，安装方式为粘贴壳体上。 The main antenna material of GF030 is FPC, and the installation method is to stick it onto the shell.

3、环境处理 environmental treatment

试结论及注意事项：

GF030 数据满足 GSM900/1800/850/1900+LTE 1/2/3/4/5/7/8/20/28/38/39/40/41+WCDMA 1/2/4/5/8 性能要求，本报告紧适用于 GF030 机型，任何主板版本有变更或者射频物料更改，手机配件（如摄像头，屏，喇叭，马达等）有变动，都必须经过我司测试验证后方可使用。 Conclusion and precautions: GF030 data meets the requirements of GSM900/1800/850/1900+LTE 1/2/3/4/5/7/8/20/28/38/39/40/41+WCDMA 1/2/4/5/8 performance requirements, this report is strictly applicable to GF030 models. Any changes in motherboard version or RF material, or changes in mobile phone accessories (such as cameras, screens, speakers, motors, etc.) must be tested and verified by our company before use.

4、工程尺寸图 Engineering dimension drawing